ICTS Special Colloquium

Title : “Doing QED with $\alpha=10$: Why does graphene behave as a weak-coupling system?”

Speaker : Sankar Das Sarma, University of Maryland

Date : Friday, January 31, 2020

Time : 3:30 PM

Venue : Emmy Noether Seminar room, ICTS Campus, Bangalore

Abstract : I will discuss effects of electron-electron interaction in graphene (and twisted bilayer graphene) where the low energy dispersion is linear and Dirac-like, and the system is described by a QED-like continuum field theory at low energies, with the caveat that the applicable fine structure constant, instead of being 1/137, is larger than one. QED is the most well-understood theory in all of physics where experiments and theory agree to an astonishing 14 decimal places, but we have little understanding of QED for large coupling constants and at high energies where Landau pole still casts a dark shadow. I will discuss how suitable condensed matter systems could shed light on both the non-perturbative and Landau pole aspects of QED in an experimentally accessible manner. The talk should appeal to (but comes with no guarantee) to particle, condensed matter, nuclear, and mathematical physicists.